WHAT IS CLAIMED IS:

1. A method of processing a frequency division multiplexed signal representing a plurality of symbols and including a plurality of tones, a first subset of said plurality of tones being allocated to a first user, the method comprising the steps of:

performing a time domain to frequency domain transform operation on the frequency division multiplexed signal to generate a frequency domain signal there from;

filtering the frequency domain signal to remove tones in said plurality of tones which are not included in said first subset of tones;

performing a frequency domain to time domain transform operation on the filtered frequency domain signal to generate a filtered time domain signal; and

recovering symbols transmitted to the first user from the filtered time domain signal.

2. The method of claim 1, wherein recovering symbols includes:

performing a channel equalization operation on the filtered time domain signal.

3. The method of claim 2, wherein recovering symbols further includes performing a channel estimation operation, said channel estimation operation including:

identifying a training symbol in the filtered time domain signal; and

generating at least one channel estimation as a function of the difference between the identified training symbol and a known training symbol value.

4. The method of claim 2,

wherein the frequency division multiplexed signal corresponds to multiple symbol periods, the portion of the received signal corresponding to each symbol period including at least one training symbol; and

wherein recovering symbols further includes performing a channel estimation operation, said channel estimation operation including, for each symbol period:

identifying a training symbol in the filtered time domain signal; and

generating at least one channel estimation as a function of the difference between the identified training symbol and a known training symbol value.

5. The method of claim 2, wherein the frequency division multiplexed signal corresponds to multiple dwells, each dwell being a period of time equal to multiple symbol periods, the first user being allocated the first subset of said plurality of tones for use throughout one of said dwells, the method further comprising:

performing a channel estimation operation including, for each dwell:

identifying a training symbol in the filtered time domain signal received during one symbol period within the dwell; and

generating a channel estimation as a function of the difference between the

identified training symbol and a known training symbol value.

6. The method of claim 5,

wherein performing a channel equalization operation includes:

using a channel estimation generated from a training symbol received during a dwell to perform a channel equalization operation on a portion of the filtered time domain signal corresponding to a symbol period in said dwell which does not include said identified training symbol.

7. The method of claim 5,

wherein all of a plurality of symbols received during one of said symbol periods in each dwell include training symbols;

wherein performing a channel estimation operation for each dwell further includes:

generating a channel estimation for each of the training symbols received during said one of said symbol periods.

8. The method of claim 7, wherein performing a channel equalization operation includes:

using the channel estimations generated from each of the received training symbols during said one of said symbol periods in each dwell, to perform separate channel equalization operations on each portion of the

filtered time domain signal corresponding to a symbol in at least one other symbol period included in the same dwell in which the training symbols used to generate the channel estimations were received.

9. The method of claim 8, the symbol period in which all received symbols are training symbols is located at the center of each dwell.

10. The method of claim 2,

wherein the frequency division multiplexed signal is an orthogonal frequency division multiplexed signal; and

wherein recovering symbols transmitted to the first user includes:

mapping values of the filtered time domain signal at instants in time used to transmit symbol values to values in a set of symbol values.

11. The method of claim 10, wherein recovering symbols transmitted to the first user further includes:

performing a symbol value to symbol value mapping operation to map symbol values generated by mapping values of the filtered time domain signal to values in another set of symbol values.

12. The method of claim 10,

wherein performing a time domain to frequency domain transform operation includes performing one of a

Fast Fourier Transform operation and a Discrete Fourier Transform operation; and

wherein performing a frequency domain to time domain transform operation includes performing one of an Inverse Fast Fourier Transform operation and an Inverse Discrete Cosine Transform operation.

13. The method of claim 12, further comprising:

receiving the frequency division multiplexed signal from a communications channel including frequency division multiplexed signals corresponding to users other than the first user.

14. An apparatus for processing a frequency division multiplexed signal representing a plurality of symbols and including a plurality tones, a first subset of said plurality of tones being allocated to a first user, the apparatus comprising:

a time to frequency domain transform module for generating a frequency domain signal from the frequency division multiplexed signal;

a tone filter for filtering from the frequency domain signal generated by the time domain to frequency domain transform module tones other than those included in the first subset to thereby generate a filtered frequency domain signal;

a frequency to time domain transform module for performing a frequency domain to time domain transform operation on the filtered frequency domain signal to thereby generate a time domain signal; and

a time instant to symbol mapping module coupled to the frequency to time domain transform module for mapping signal values at points in time to symbol values.

15. The apparatus of claim 14, further comprising:

a channel equalization module coupling said frequency to time domain transform module to the time instant to symbol mapping module, the channel equalization module performing channel equalization operations on said time domain signal.

16. The apparatus of claim 15, further comprising:

a channel estimation circuit coupled to said frequency to time domain transform module and to the channel equalization module for generating at least one channel estimate from the time domain signal and for supplying the channel estimate to the channel equalization module.

17. The apparatus of claim 16, further comprising;

a symbol to symbol mapping module coupled to the time instant to symbol mapping module.

18. The apparatus of claim 16, further comprising:

a cyclic prefix discarding circuit coupled to the time to frequency domain transform module for discarding portions of the frequency division multiplexed signal corresponding to cyclic prefixes.

19. The apparatus of claim 14,

wherein the frequency division multiplexed signal is an orthogonal frequency division multiplexed signal;

wherein the time to frequency domain transform module is a Fast Fourier Transform circuit; and

wherein the frequency to time domain transform module is an inverse Fast Fourier Transform circuit.

20. A method of processing a received orthogonal frequency division multiplexed signal to generate symbol values, the method comprising;

performing a channel equalization operation on the received OFDM signal in the time domain; and

mapping values of the OFDM signal after channel equalization at instants in time used to transmit symbol values to symbol values.

21. The method of claim 20, further comprising:

filtering the OFDM signal in the frequency domain to remove undesired signal tones prior to performing said channel equalization operation on the received signal in the time domain.

22. An orthogonal frequency division multiplexed (OFDM) signal receiver for receiving an OFDM signal, the receiver comprising:

a time domain channel equalization module for performing a channel equalization operation on the OFDM signal in the time domain; and

a time instant to symbol mapping module for mapping values of the OFDM signal after channel equalization at instants in time used to transmit symbol values to symbol values.

23. The receiver of claim 22, further comprising:

a time to frequency domain signal transform circuit for converting the received OFDM signal to the frequency domain;

a tone filter coupled to the time to frequency domain signal transform circuit for performing a filtering operation on the received OFDM signal in the frequency domain; and

a frequency domain to time domain transform circuit coupling the tone filter to the time domain channel equalization module for converting the filtered signal back into the time domain.

24. A communications system comprising:

an orthogonal frequency division multiplexed signal transmitter including:

a symbol to time instant mapping module for mapping a plurality of symbols to be transmitted to uniformly spaced points in time within a time period corresponding to a symbol duration; and

an orthogonal frequency division multiplexed signal receiver including:

a time instant to symbol mapping module for mapping signal values at points in time used to transmit symbols to symbol values.

25. The system of claim 24, wherein the receiver further includes:

a time domain to frequency domain transform circuit for converting a received signal from the time domain to the frequency domain;

a tone filter coupled to the time domain to frequency domain transform circuit for filtering tones, outside a set of tones used by the receiver, from the received signal in the frequency domain; and

a frequency domain to time domain transform circuit for coupling the tone filter to the time instant to symbol mapping module.

26. The system of claim 24, wherein the receiver further includes a time domain channel equalization circuit coupled between the frequency domain to time domain transform circuit and the time instant to symbol mapping circuit.